Amendment to the Claims

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for etching a stack with at least one silicon germanium layer over a substrate in a processing chamber and a polysilicon layer over the silicon germanium layer, wherein at least one region of the polysilicon layer is doped and at least one region of the polysilicon layer is undoped, comprising:

~~providing a silicon germanium etch, comprising:~~

~~providing an etchant gas into the processing chamber, wherein the etchant gas comprises HBr, an inert diluent, and at least one of O_2 and N_2;~~

~~cooling the substrate to a temperature below 40° C; and~~

~~transforming the etching gas to a plasma to etch the silicon germanium layer; and~~

providing a break through etch of the polysilicon layer over the silicon germanium layer, wherein the break through etch simultaneously etches the~~, wherein~~ at least one doped region and the at least one undoped region of the polysilicon layer ~~is doped~~, comprising:

providing an etchant gas into the processing chamber, wherein the etchant gas comprises N_2, SF_6, and at least one of CHF_3 and CH_2F_2; and

transforming the etching gas to a plasma to simultaneously etch the at least one doped region and at least one undoped region of the polysilicon layer;

providing a polysilicon main etch after the break through etch, comprising:

providing an etchant gas with at least one of Cl_2, HBr, CF_4, and O_2; and

transforming the etching gas to a plasma that etches the polysilicon layer completely through to the silicon germanium layer; and

providing a silicon germanium etch after the polysilicon main etch, comprising:

providing an etchant gas into the processing chamber, wherein the etchant gas comprises HBr, an inert diluent, and at least one of O_2 and N_2;

cooling the substrate to a temperature below 40° C; and

transforming the etching gas to a plasma to etch the silicon germanium layer.

2. (Canceled)

3. (Canceled)

4. (Currently Amended) The method, as recited in claim ~~3~~ 1, wherein the etching the silicon germanium layer and the polysilicon layer provides a vertical profile.

5. (Original) The method, as recited in claim 4, wherein the stack further comprises a seed silicon layer under the silicon germanium layer, wherein the SiGe etch etches through the seed silicon layer.

6. (Original) The method, as recited in claim 5, wherein combined thicknesses of the seed silicon layer and silicon germanium layer is between 10 and 50 nanometers.

7. (Original) The method, as recited in claim 6, further comprising providing a photoresist mask over the stack.

8. (Original) The method, as recited in claim 7, wherein the photoresist mask is of a 193 or higher generation photoresist.

9. (Canceled)

10. (Original) The method, as recited in claim 1, wherein combined thicknesses of the seed silicon layer and silicon germanium layer is less than half a thickness of the polysilicon layer.

11. (Original) The method, as recited in claim 1, wherein the stack further comprises a seed silicon layer under the silicon germanium layer, wherein the SiGe etch etches through the seed silicon layer.

12. (Original) The method, as recited in claim 11, wherein combined thicknesses of the seed silicon layer and silicon germanium layer is between 10 and 50 nanometers.

13. (Original) The method, as recited in claim 1, further comprising providing a photoresist mask over the stack.

14. (Original) The method, as recited in claim 13, wherein the photoresist mask is of a 193 or higher generation photoresist.

15. (Withdrawn) A semiconductor device formed by the method of claim 1.

16. (Currently Amended) A method of etching a polysilicon layer over a substrate, wherein the polysilicon layer has at least one doped region and at least one undoped region, comprising:

placing the substrate in a processing chamber;

providing an etchant gas into the processing chamber, wherein the etchant gas comprises N_2, SF_6, and at least one of CHF_3 and CH_2F_2; and

transforming the etching gas to a plasma to simultaneously etch the ~~polysilicon layer with~~ at least one doped region and at least one undoped region of the polysilicon layer; and

providing a polysilicon main etch, comprising:

providing an etchant gas with at least one of Cl_2, HBr, CF_4, and O_2; and

transforming the etching gas to a plasma to etch the polysilicon layer.

17. (Canceled)

18. (Currently Amended) The method, as recited in claim ~~17~~ 16, further comprising providing a photoresist mask over the stack.

19. (Original) The method, as recited in claim 18, wherein the photoresist mask is of a 193 or higher generation photoresist.

20-22. (Canceled)